Distributed Trust Management: Assignment 1

Deadline: 2 December 2013
How to submit the assignment: – by email (n.zannone at tue dot nl)
For any question send me an email

Questions

1. Search in the news an article about privacy violations. Describe briefly the reported incident and discuss its privacy implications (at most one page). The reference (or url) to the article should be given. **Note:** The article should be at most six months old.

2. Consider the access matrix of HRU model.

   (a) Compute the matrix that results from the following initial state

	File 1	File 2	File 3
Alice	own	own	
Bob		read	own
Charlie			

   by executing the sequence of commands α defined as follows:

1. $CONFER_{write}(Bob, Alice, File3)$
2. $CONFER_{*read}(Bob, Alice, File3)$
3. $CONFER_{*read}(Bob, Bob, File1)$
4. $CONFER_{*read}(Charlie, Charlie, File2)$
5 $TRANSFER_{read}(Bob, Charlie, File2)$
6. $CREATE(Alice, File4)$
7. $CONFER_{*write}(Alice, Bob, File4)$
8. $CONFER_{*write}(Alice, Bob, File1)$
9. $CONFER_{*read}(Alice, Alice, File1)$
10. $TRANSFER_{read}(Alice, Bob, File4)$
11 $TRANSFER_{read}(Alice, Charlie, File2)$
12. $TRANSFER_{read}(Alice, Charlie, File3)$
13. $TRANSFER_{write}(Alice, Charlie, File3)$
14. $TRANSFER_{write}(Alice, Charlie, File4)$
15. $TRANSFER_{write}(Bob, Alice, File1)$
16. $TRANSFER_{write}(Bob, Alice, File4)$
17. $TRANSFER_{write}(Bob, Charlie, File1)$
18. $REVOKE_{read}(Alice, Bob, File1)$
19. $REVOKE_{read}(Alice, Charlie, File1)$
20. $REVOKE_{write}(Alice, Charlie, File1)$
21. $REVOKE_{read}(Alice, Bob, File2)$
22. $REVOKE_{read}(Bob, Alice, File3)$
23. $REVOKE_{write}(Bob, Alice, File1)$
24. $REVOKE_{write}(Bob, Alice, File3)$
25. $REVOKE_{read}(Bob, Charlie, File3)$
26. $REVOKE_{write}(Bob, Charlie, File3)$

   (b) Is α leaking access privileges? (Consider only Charlie to be untrusted) Justify the answer.

3. Draw a classification lattice for the following sensitivity levels and compartments:

   - sensitivity levels: public, secret, where secret > public;
   - compartments: {army, navy, nuclear}.

   Define the least upper bound (lub) and greatest lower bound (glb) of the following pairs of security classes:

Class 1	**Class 2**	**lub**	**glb**
(secret,{army})	(secret,{nuclear})		
(public,{army})	(secret,{army})		
(public,{army,navy})	(secret,{nuclear})		
(public,{army,nuclear,navy})	(secret,{})		
(public,{army})	(secret,{army,navy})		

4. Let c_1 and c_2 be two consultants working at the same company. Suppose that c_1 works with Bank A and c_2 works with Bank B. Both c_1 and c_2 work with Insurance Company C which is in a different class of conflict of interest than the banks.

   - Explain the possible security breach if the only policy enforced is the simple property of the Chinese wall model.
   - Show how that leak could be prevented by taking into account (and enforcing) the *-policy.

5. Define a RBAC_3 system to regulate a bank information system. The system should implement (at least) the following requirements:

   (a) Bank employees (both managers and clerks) are allowed to make financial reports about customers.

   (b) Bank employees can make loan offers to clients.

   (c) Loan offers below 5000 euro can be approved by a clerk.

   (d) Loan requests over 5000 euro must be approved by a manager.

   (e) Loan requests over 10000 euro must be approved by two managers.

   (f) A bank employee cannot approve his loan request.

6. Describe the Take-grant access control model. Discuss the main differences with the Harrison-Ruzzo-Ullman model.